

DOCUMENT RESUME

ED 079 153

SE 016 541

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TITLE A Supplementary Program for Environmental Education,
Industrial Arts, Grade 7-12.
INSTITUTION Project I-C-E, Green Bay, Wis.
SPONS AGENCY Bureau of Elementary and Secondary Education
(DHEW/OE), Washington, D.C.
PUB DATE 72
NOTE 76p.
EDRS PRICE MF-\$0.65 HC-\$3.29
DESCRIPTORS Behavioral Objectives; *Environmental Education;
Fundamental Concepts; *Industrial Arts; Instructional
Materials; Interdisciplinary Approach; Learning
Activities; *Lesson Plans; *Secondary Grades;
*Teaching Guides
IDENTIFIERS ESEA Title III

ABSTRACT

Presented in this teacher's guide for grades 7-12 are lesson plans and ideas for integrating industrial arts (drafting, woodworking, and metals) and environmental education. Each lesson originates with a fundamental concept pertaining to the environment and states, in addition, its discipline area, subject area, and problem orientation. Following this, behavioral objectives and suggested learning experiences are outlined. Behavioral objectives include cognitive and affective objectives and skills to be learned, while learning experiences list student-centered in-class activities and outside resource and community activities. Space is provided for teachers to note resource and reference materials--publications, audio-visual aids, and community resources. The guides are supplementary in nature and the lessons or episodes are designed to be placed in existing course content at appropriate times. This work was prepared under an ESEA Title III contract for Project I-C-E (Instruction-Curriculum-Environment). (BL)

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Project I - C - E

INSTRUCTION - CURRICULUM - ENVIRONMENT

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A SUPPLEMENTARY PROGRAM FOR ENVIRONMENTAL EDUCATION

DISCIPLINE AREA Industrial Arts GRADE 7-12

1. Drafting

2. Woodworking

3. Metals

Produced under Title III E.S.E.A.
PROJECT I-C-E
Serving Schools in CESA's 3-8-9
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FOR ENVIRONMENTAL EDUCATION

Arts GRADE 7-12

rafting

oodworking

itals

E.S.E.A.

A's 3-8-9

54301

(468-7464)

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PREFACE

"Oikus" for house is the Greek origin of the term "ecology". We studies our house--whatever or wherever it may be. Like an umbrella expand or contract to fit many ranges--natural and man-made. We environments, our many "houses" if we omit rancor and cite long complexities. Our "oikus" uses the insights of all subjects. The multidisciplinary program like ours necessarily results. Also, a long time, our program ranges K thru 12. The environment mirrors values. These values have their origin in the "oikus" of our minds. Let us become masters of our house by replacing the Greek with "Know thyself and thine house."

1. Written and designed by your fellow teachers, this guide is designed to fit appropriately into existing, logical course content.
2. Each page or episode offers suggestions. Knowing your students to adapt or adopt. Limitless chances are here for your experiments. Many episodes are self contained, some open-minded, still others developed over a few days.
3. Try these episodes, but please pre-plan. Why? Simply, no guide and no curriculum will work unless viewed in the context of your school.
4. React to this guide with scratch ideas and notes on the episodes.
5. After using an episode, fill out the attached evaluation form. Duplicate, or request more of these forms. Send them singly. We sincerely want your reactions or suggestions--negative and evaluations are the key in telling us "what works" and in aiding the guides.

TERMS AND ABBREVIATIONS

ICE RMC is Project ICE Resource Materials Center serving all public school districts in CESA 3, 8, and 9. Check the Project ICE Bibliography for resources. Our address and phone number is on this guide's cover or call us for any materials or help.

BAVI is Bureau of Audio Visual Instruction, 1327 University Avenue, Madison, Wisconsin 53701 (Phone: 608-262-1644).

Cognitive means a measurable mental skill, ability, or process. Affective refers to student attitudes, values, and feelings.

PREFACE

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fit many ranges--natural and man-made. We can add quality to our
"houses" if we omit rancor and cite long range gains, costs, and
"oikus" uses the insights of all subjects. Thus, a rational, positive,
program like ours necessarily results. Also, since attitudes grow over
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masters of our house by replacing the Greek adage of "Know thyself":
"thine house."

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NS

ICE Resource Materials Center serving all public and non-public
SA 3, 8, and 9. Check the Project ICE Bibliography of available
Bib materials and phone number is on this guide's cover. Feel free to write
over materials or help.
Av. ilio Visual Instruction, 1327 University Avenue, P. O. Box 2093,
ss 01 (Phone: 608-262-1644).
surable mental skill, ability, or process based on factual data.
student attitudes, values, and feelings.

ACKNOWLEDGEMENTS: The following teachers and consultants participated in the
cf the Supplementary Environmental Education Guides:

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John Anderson, Peshtigo
Walter Anderson, Wausaukee
Bonnie Beamer, Coleman
Merlyn Blonde, Shawano
R. A. Dirks, Gillett
Dennis Dobrzenski, White Lake
LeRoy Gerl, Oconto
Karen Grunwald, St. James (L)
William Harper, Lena
Sister Claudette, St. Charles
Ervin Kunesh, Marinette
Kathleen LeBreck, Oconto
P. E. Lewicki, Gillett
Dorothy C'Brien, Wausaukee
Terry Otto, St. John (L)
Arthur Paulson, Cconto Falls
Marie Prochaska, Lena
Christine Proctor, Wausaukée
Arthur Schelk, Suring
Peter Skroch, Cconto Falls
David Soltesz, Crivitz
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Lord, Little Wolf
Meyer, Neenah
Neuzil, Shiocton
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Mary Smith, Green Bay
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Mary Wadzinski, How.-Suam.

C
 O I. Energy from the sun, the basic source
 N of all energy, is converted through Discipline Area Industri
 C
 E plant photosynthesis into a form Subject Drafting
 P
 T all living things can use for life Problem Orientation How
 processes. is related to the Diazo P

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING EX
<u>Cognitive:</u> The student will be able to produce a quality Diazo Print-- properly exposed.	I. Student-Centered in class activity	II.
<u>Affective:</u> The student will understand the importance of original's overall quality and exposure time to print development.	A. Demonstrate need for translucent original-- Run print using opaque and translucent original. Compare results. B. Show film. C. Make print with Sun Frame method. D. Make print with Diazo process. E. Have students compare and discuss process and results. Advantages and disadvantages F. Point out Diazo Process is controlled Sun energy. G. Develop bulletin board for trouble shooting Diazo prints (If this happened--you did this wrong) H. List other "Sun Energy" uses	A car ed

RSEA Title III : 59-70-0135-2 Project I-C-E

the basic source
converted through Discipline Area Industrial Arts
into a form Subject Drafting
use for life Problem Orientation How Sun Energy Grade 7-12
is related to the Diazo Process

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity	II. Outside Resource and Community Activities
	A. Visit commerical blue print operation.
A. Demonstrate need for translucent original-- Run print using opaque and translucent original. Compare results.	
B. Show film.	
C. Make print with Sun Frame method.	
D. Make print with Diazo process.	
E. Have students compare and discuss process and results. Advantages and disadvantages	
F. Point out Diazo Process is controlled Sun energy.	
G. Develop bulletin board for trouble shooting Diazo prints (If this happened-you did this wrong)	
H. List other "Sun Energy" uses	

Resource and Reference Materials

Continued and Additional Suggested I te

Publications:

Industrial Arts Drafting,
Walker-Ilevyak, Goodheart-
Willcox Co.
Drafting Technical Comm.,
Lawrence S. Wright,
McKnight & McKnight

Audio-Visual:

Walt Disney's "The Mystery
of The Cosmic Rays."

Community:

Materials Continued and Additional Suggested Learning Experiences

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C 2 All living organisms interact
O
N among themselves and their
C environment, forming an intricate
P
T unit called an ecosystem.

Discipl. c-area Industrial
Subject Drafting
Problem Orientation Clean

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING EXPERIENCES
<u>Cognitive:</u> The student will clean-up when the period arrives, and not only do his responsibility but also check overall results.		I. Student-Centered in class activity.
<u>Affective:</u> The student will understand all living systems interact among themselves and their environment, realizing clean-up is a combined effort, not an effort by an individual.		A. Let clean-up go for one day. B. Allow students to work 2nd day in messy area with dirty equipment. C. Evaluate on 3rd day the need for clean-up and relate it to the shop production and environment. D. Organize schedule of duties and responsibilities stressing teamwork. E. Discuss and compare results of clean-up versus no clean-up, and discuss group interaction as it relates to clean-up.
<u>Skills to be Learned</u>		
A. Cooperation B. Responsibility C. Benefits of clean-up. <ul style="list-style-type: none"> 1. Neater drawings. 2. Equipment in proper place. 3. Better working atmosphere. 4. Safer place to work. 		

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and their _____
ng an intricate
system. _____

Discipline Area Industrial Arts
Subject Drafting
Problem Orientation Clean-Up Grade 7-12

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SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity.	II. Outside Resource and Community Activities
	A. Let clean-up go for one day. B. Allow students to work 2nd day in messy area with dirty equipment. C. Evaluate on 3rd day the need for clean-up and relate it to the shop production and environment. D. Organize schedule of duties and responsibilities stressing teamwork. E. Discuss and compare results of clean-up versus no clean-up, and discuss group interaction as it relates to clean-up.

<u>Resource and Reference Materials</u> <u>Publications:</u>	<u>Continued and Additional Suggested Learning</u> <u>Materials:</u>
	<u>(Con't from E)</u>
	<ol style="list-style-type: none"> 1. Develop methods of making clean-up re more efficient. 2. Develop list on where use a team cle would be beneficial.
<u>Audio-Visual:</u>	
<u>Community:</u> <u>Safety Inspector</u> <u>Industrial Commission</u>	

arni Continued and Additional Suggested Learning Experiences
ton't from E)

re Develop methods of making clean-up responsibility
more efficient.
cle Develop list on where else a team clean-up effort
would be beneficial.

C 3. Environmental factors are limiting
 O on the numbers of organisms living Discipline Area
 N within their influence, thus, each Subject
 C environment has a carrying capacity. Problem Orienta
 E P T

Project Title		Behavioral Objectives	Suggested L
III	59-70-0135-2	<p>Cognitive: Students will be able to select and or design joint (s) that best suits the job. (Appearance, strength, ease of making, etc.)</p> <p>Affective: The student will understand how grain, materials, fasteners, fit affect joint quality.</p> <p>Skills to be Learned</p> <p>Joint use and design</p> <ol style="list-style-type: none"> 1. Material strength 2. Joint use <ol style="list-style-type: none"> A. Inside-Outside B. Structural Appearance 3. Ease of construction. 	<p>I. Student-Centered in class activity</p> <ol style="list-style-type: none"> A. Have students design simple joints for strength and or appearance. B. Develop test for joints around available equipment, test for: <ol style="list-style-type: none"> 1. Strength <ol style="list-style-type: none"> A. Shear B. Stress C. Compression D. Tensile 2. Appearance (Pure value judgement) 3. Ease of making & cation C. Incorporate joints in project drawing. D. Bean bag discussion "Draw parallels between joint breakdown and ecosystem breakdown. (i.e. Poorly constructed neglected joint breaks under stress, as ecosystem does when congested, and neglected.)

1 factors are limiting

Area of organisms living influence, thus, each a carrying capacity. Discipline Area Subject Problem Orientation Industrial Arts Drafting Joint Design & Grade 7-12 Carrying Capacity

DEFINING CHARACTERISTICS	SUGGESTED LEARNING EXPERIENCES	
1. Student-Centered in class activity a. Have students design simple joints for strength and or appearance. b. Develop test for joints around available equipment, test for: 1. Strength a. Shear b. Stress c. Compression d. Tensile 2. Appearance (Pure value judgement) 3. Ease of making & application c. Incorporate joints in project drawing. d. Bean bag discussion "Draw parallels between joint breakdown and ecosystem breakdown. (i.e. Poorly constructed or neglected joint breaks down under stress, as ecosystem does when congested, abused or neglected.	II. Outside Resource and Community Activities a. Field trip to local manufacturing plant. Talk with product engineer. b. Forest products lab. evaluate students joint designs.	

Resource and Reference Materials	Continued and Additional Suggested
<p><u>Publications:</u></p> <p><u>Drafting Technical Communication</u> Lawrence S. Wright McKnight & McKnight, Bloomington, Ill., 1968</p> <p><u>Mechanical Drawing</u> French & Svensen McGraw Hill, 1966</p> <p><u>Audio-Visual:</u></p> <p>Starley Tools Film Strips Charts Movies</p> <p>Bavi #2666 Design for ARC Welded Structures</p> <p>Bavi #1217 Using Nails and Screws</p> <p><u>Community:</u></p> <p>Forest Products Laboratory</p>	<p>Continued evaluation of joint se Develop a collection of joints. Conduct a contest for joint stre quality wanted.</p>

Science Materials Continued and Additional Suggested Learning Experiences

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t,
1968

Communication
Continued evaluation of joint selection.
Develop a collection of joints.
Conduct a contest for joint strength or whatever
quality wanted.

for ARC Welded
Nails and Screws
Laboratory

C 4. An adequate supply of pure

O

N water is essential for life.

C

E

P

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Discipline Area Industrial

Subject Drafting

Problem Orientation Waste Wa

Title ESEA Title III - 59-70-0135-2 Project I-C-1	BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES
	<p><u>Cognitive:</u> The student will be able to list the types of paper used in drafting. The student will be able to name the paper companies having waste water treatment facilities within a 20 mile radius of the school.</p> <p><u>Affective:</u> The student will appreciate the effect of clean water on recreation, fishing, ect.</p>	<p>I. Student-Centered in class activity</p> <p>A. Students will study types of paper used in drafting.</p> <ol style="list-style-type: none">1. Rag2. Sulphite <p>B. In connection with paper making, student will study water treatment facilities in paper companies.</p> <ol style="list-style-type: none">1. Machine used in treatment.2. Chemicals used in treatment.3. Short and long term plans for water treatment facilities. <p>C. Develop bulletin board flow charts showing waste water treatment process.</p>
	<p><u>Skills to be Learned</u></p> <ol style="list-style-type: none">1. Paper composition2. How paper is made3. The treatment of water after it is used in a paper mill.	

supply of pure

ial for life.

Discipline Area Industrial Arts

Subject Drafting

Problem Orientation Waste Water Grade 7-12

SUGGESTED LEARNING EXPERIENCES	
	<p>I. Student-Centered in class activity</p> <p>A. Students will study types of paper used in drafting.</p> <ol style="list-style-type: none">1. Rag2. Sulphite <p>B. In connection with paper making, student will study water treatment facilities in paper companies.</p> <ol style="list-style-type: none">1. Machine used in treatment.2. Chemicals used in treatment.3. Short and long term plans for water treatment facilities. <p>C. Develop bulletin board flow charts showing waste water treatment process.</p> <p>II. Outside Resource and Community Activities</p> <p>A. Field trip to a paper mill.</p> <p>B. Public relations dept. of a local paper mill.</p>

Resource and Reference Materials

Publications:

Books:

Pulp and Paper,
500 Howard St.
San Francisco, Calif. 94105
American Paper Industry
2570 Devon Avenue
DesPlaines, Ill. 60018
Chem Paper Processing
Hale Publishing Company
One Pan^k Street
Stanford, Conn. 06901

Audio-Visual:

Recycling Paper
Riverside Paper Company
Appleton, Wisconsin
Great White Trackaway
Hamermill Paper Company
Erie, Pennsylvania

Community:

Public Relations Dept. of
an area paper mill.

Continued and Additional Suggested Lear s

earns | Continued and Additional Suggested Learning Experiences

C 5. An adequate supply of clean air
 O is essential because most organisms Discipline Area
 N depend on oxygen, through respiration, Subject
 C P to release the energy in their food. Problem Orientat
 E

BEHAVIORAL OBJECTIVES		SUGGESTED LE
Cognitive: The student will be able to plan and design a sub-division including adequate vegetation areas.	Affective: The student will list two or three ways in which vegetation areas promote air quality	<p>I. Student-Centered in class activity</p> <p>A. Teacher will explain and lead discussion on photo synthesis.</p> <p>B. Determine (as a result of discussion) why trees, shrubs, and other green are important to clean air.</p> <p>C. Have students roughly design sub-division by using plot plans.</p> <p>D. Evaluate sub-divisions of</p> <ol style="list-style-type: none"> 1. Green Areas 2. % of house to lot 3. Privacy area 4. Practicality
Skill to be Learned		
A. Plot planning		
B. Space conservation		
C. Organic architecture		

ESEA Title III -70-0135-2 Project MC

e supply of clean air

ea because most organisms Discipline Area Industrial Arts

n, through respiration, Subject Drafting - Arch.

cat energy in their food. Problem Orientation Green Areas Grade 11-12

JECTIVES	SUGGESTED LEARNING EXPERIENCES	
dent will d design luding n areas. dent will ays in reas pro- d ion cture ot	<p>I. Student-Centered in class activity</p> <p>A. Teacher will explain and lead discussion on photosynthesis.</p> <p>B. Determine (as a result of discussion) why trees, shrubs, and other greenery are important to clean air.</p> <p>C. Have students roughly design sub-division by using plot plans.</p> <p>D. Evaluate sub-divisions on:</p> <ol style="list-style-type: none">1. Green Areas2. % of house to lot3. Privacy area4. Practicality	<p>II. Outside Resource and Community Activities</p> <p>A. Presentation by sub-division planner who utilizes vegetation areas.</p> <p>B. Field trip or area study of local subdivisions to see if studied concepts are actually applied.</p>

Resource and Reference Materials	Continued and Additional Suggested
<u>Publications:</u>	1. Have students continue search "ideal" sub-division in area usage for air quality.
<u>Architecture Drafting and Design</u> , Hepler & Wallach McGraw Hill, 1965 <u>Soil Surveys and Land Use Planning</u> , Soil Science Society of America & American Society of Agronomy, 1966	
<u>Audic-Visual:</u> Bavi #6730 <u>New Guidelines for the Well Landscaped Home.</u>	

ials Continued and Additional Suggested Learning Experiences

1. Have students continue searching for
"Ideal" sub-division in areas of vegetation
usage for air quality.

<p style="text-align: right;">ESEA Title III - 7000135-2 Project I-C-E</p>	<p>C O N C E P T</p> <p>6. <u>Natural resources are not equally distributed over the earth or over time and greatly affect the geographic conditions and quality of life.</u></p>	<p>Discipline Area <u>Industrial</u></p>
		<p>Subject <u>Drafting</u></p> <p>Problem Orientation <u>Project</u></p>
	<p>BEHAVIORAL OBJECTIVES</p> <p><u>Cognitive:</u> Each student will be able to efficiently plan projects to use as little natural resources as possible</p> <p><u>Affective:</u> The student will be given guide lines for a specific project and he will choose materials which reflect low waste.</p> <p><u>Skills to be Learned</u></p> <p>A. Maximum material usage</p> <p>B. Production planning</p> <p>C. Production efficiency</p>	<p>SUGGESTED LEARNING EXPERIENCES</p> <p>I. Student-Centered in class activity</p> <p>A Design projects that will be of a nature that will help students plan projects to put natural resources to their greatest use-- As little waste as possible</p> <p>Example:</p> <p>Design bird houses from a 4 x 8 plywood sheet.</p> <p>A. Bird house requirement</p> <p>1. Floor size</p> <p>2. Hole size</p> <p>3. Hole above floor</p> <p>4. Bird</p> <p>Design house cutting diagram.</p>

sources are not equally

over the earth or over Discipline Area Industrial Arts
they affect the geo- Subject Drafting
ptions and quality of Problem Orientation Project Planning Grade 7-12

EXPECTIVES	SUGGESTED LEARNING EXPERIENCES	
I. Student will plan little possible nt will for a he will reflect	I. Student-Centered in class activity A Design projects that will be of a nature that will help students plan projects to put natural resources to their greatest use-- As little waste as possible Example: Design bird houses from a 4 x 8 plywood sheet. A. Bird house requirement 1. Floor size 2. Hole size 3. Hole above floor 4. Bird Design house cutting dia- gram.	II. Outside Resource and Community Activities A. DNR Representative B. Forest Products Lab.
useage ing iciency		

Resource and Reference Materials	Continued and Additional Suggested Learning
<u>Publications:</u> DNR. Publications <u>Drawing for Product Planning,</u> George E. Stephenson Chas. A. Bennette Co., Inc. 1970	1. On every project reflect material use 2. Develop a collection of projects which excellent material usage.
<u>Audio-Visual:</u>	
<u>Community:</u> Design engineers from local manufacturer.	

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Continued and Additional Suggested Learning Experiences

1. On every project reflect material usage.
2. Develop a collection of projects which reflect excellent material usage.

C 7. Factors such as facilitating
 O transportation, economic conditions, Discipline Area In
 N population growth, and increased Subject Dr
 C leisure time have a great influence Problem Orientation
 E on changes in land use and centers
 P of population desity.
 T

BEHAVIORAL OBJECTIVES SUGGESTED LEARN.

E-C Cognitive: The student
 H will know how lack of plann-
 P ing years ago is now pro-
 O ducing land use problems in
 T his local community.
 R Affective: The student
 C will list the steps to
 T be taken for better
 O community land use.

I. Student-Centered in class
 activity
 A. Students working in group
 will produce a slide pre-
 sentation of good and poor
 land use in the community
 B. Discussion on steps to be
 taken for better local
 land use.

ESEA Title III
 70-0135-2
 Skills to be Learned
 How to help in community
 planning for maximum land
 usage.
 Basic map making & reading
 of topographical maps.
 Use of cameras & tape
 recorders.

ESEA Title III

rs such as facilitating

Innovation, economic conditions, Discipline Area Industrial Arts

Dr. on growth, and increased Subject Drafting

ion time have a great influence Problem Orientation Community Planning Grade 11-12
s in land use and centers
tion desity.

AR	AL OBJECTIVES	SUGGESTED LEARNING EXPERIENCES
oup re- poo ity be	<p>he student lack of plann- is now pro- se problems in munity. he student steps to etter d use.</p> <p>Learned n community maximum land ing & reading cal maps. 's & tape</p>	<p>I. Student-Centered in class activity</p> <p>A. Students working in groups will produce a slide pre- sentation of good and poor land use in the community.</p> <p>B. Discussion on steps to be taken for better local land use.</p> <p>II. Outside Resource and Community Activities</p> <p>A. Community Planners make a presentation of future plans for the community.</p> <p>B. Field trip around the community with students taking pictures and recording comments on tape for future presen- tations.</p>

Resource and Reference Materials	Continued and Additional Suggested Learning
<p><u>Publications:</u></p> <p>HUD Literature</p> <p><u>Architecture Drafting and Design</u>, Hepler & Wallach McGraw Hill, 1965</p> <p><u>Soil Surveys and Land Use Planning</u>, Soil Science Society of America & American Society of Agronomy, 1966</p>	<p>Develop picture collection of good and poor land use.</p> <p>Conduct a Contest</p> <ol style="list-style-type: none"> <li data-bbox="1099 1064 1891 1226">1. Select a real piece of property within the community which presents a problem ie, gravel pit, swamp. Have develop a long term solutions which reflect best possible use for the community.
<p><u>Audio-Visual:</u></p> <p>Student and teachers developed slides.</p>	
<p><u>Community:</u></p> <p>City Plan Commission</p>	

Materials	Continued and Additional Suggested Learning Experiences
<p>po</p> <p>ing and allach</p> <p>and Use</p> <p>wit</p> <p>ence</p> <p>ich</p> <p>e c</p> <p>f Agronomy,</p> <p>rs</p> <p>on</p>	<p>Develop picture collection of good and poor land use.</p> <p>Conduct a Contest</p> <ol style="list-style-type: none"> 1. Select a real piece of property within the the community which presents a future problem ie, gravel pit, swamp. Have students develop a long term solutions which will reflect best possible use for the community.

C 8. Cultural, economic, social, and
O political factors determine status
C of man's values and attitudes
P toward his environment.

Discipline Area Indus

Subject: Draft

Problem Orientation Ma
and re-engi

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING
<u>Cognitive:</u> Students will be able to identify objects that are both functional & economic	<u>Affective:</u> Students will observe and learn to save materials otherwise used to an excess	<ul style="list-style-type: none">I. Student-Centered in class activity<ul style="list-style-type: none">A. General concept. Include in the design the idea of the importance of using materials within limits. Usually there is too much material used for a given piece of construction.B. Students in engineering drafting can divide up the parts to save on excess materials.C. Redesign parts to use standard materials to cut down machine time and/or save assembly operations.
<u>Skills to be Learned</u> <ul style="list-style-type: none">A. Material usageB. RedesignC. Function		

Project H-C-E
59-70-0135-2
ESLA Title III

economic, social, and

du...ors determine status

Discipline Area Industrial Arts

aft...s and attitudes

Subject: Drafting

Ma...ironment.

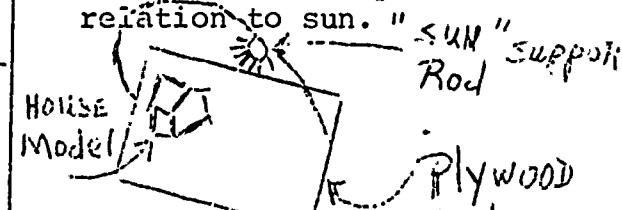
Problem Orientation Material usage Grade 9-12
and re-engineering

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Students will identify objects of functional use will be able to save material used in design	I. Student-Centered in class activity A. General concept. Include in the design the idea of the importance of using materials within limits. Usually there is too much material used for a given piece of construction. B. Students in engineering drafting can divide up the parts to save on excess materials. C. Redesign parts to use standard materials to cut down machine time and/or save assembly operations.	II. Outside Resource and Community Activities A. Product engineer local manufacturer B. Forest Products Lab. (Wood Area)

Resource and Reference Materials	Continued and Additional Suggested Listings
<u>Publications:</u> <u>Drawing for Product Planning</u> , George E. Stephenson Chas. A. Bennett Co., Inc. 1970 <u>Mechanical Drawing</u> , French & Svensen, McGraw Hill, 1966	
<u>Audio-Visual:</u> (Metals) BAVI #2666 <u>Design for I RC Welded</u> <u>Structures</u>	
<u>Community:</u> Local Engineer	

Le
s | Continued and Additional Suggested Learning Experiences

C 9. Man has the ability to manage,
 O manipulate, and change his
 N environment.
 C Discipline Area Industrial
 E Subject Drafting
 P Problem Orientation Sun Enc.
 T Orienta

BEHAVIOR'L OBJECTIVES		SUGGESTED LEARNING EXP.
<u>Cognitive:</u> The student will locate a model home to take fullest advantage of the sun.	I. Student-Centered in class activity Note - Model arrangement is used which included room modules to create given house design and home placement in relation to sun. "SUN" support Rod	II. O C L
<u>Affective:</u> The student will explain the advantages and values of proper house orientation with the sun.		
<u>Skills to be Learned</u> A. Placement of a house to use sun energy for heat and light. B. Saving of lighting costs. C. Saving of heating costs. D. Reading plot plans, maps, & azimuth charts.	 A. Have class discuss and try various arrangements for desired sun utilization. B. Explain zoning limitations. C. Present and explain azimuth-longitude charts.	

ESEA Title III - 59-70-0135-2 Project I-C-E

manage,

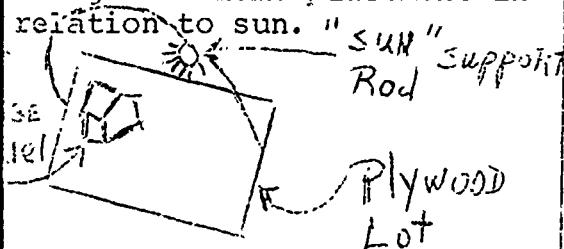
Discipline Area Industrial Arts

Subject Drafting - Arch.

Problem Orientation Sun Energy & Orientation Grade 11-12

SUGGESTED LEARNING EXPERIENCES

Student-Centered in class activity
Note - Model arrangement is used which included room modules to create given house design and home placement in relation to sun. "SUN" SUPPORT



II. Outside Resource and Community Activities
Local Architect

- A. Have class discuss and try various arrangements for desired sun utilization.
- B. Explain zoning limitations.
- C. Present and explain azimuth-longitude charts.

Resource and Reference Materials	Continued and Additional Suggested Learning Activities
<u>Publications:</u> <u>Architecture Drafting & Design</u> Hepler & Wallach, McGraw Hill, 1965	Have students study their own and neighbor's homes and determine in how many cases the home could be situated better.
<u>Audio-Visual:</u> Teacher made model.	
<u>Community:</u> Local Architect.	

Le neigh e o gn 1,	<u>Continued and Additional Suggested Learning Experiences</u> Have students study their own and neighbor's homes to determine in how many cases the home could have been situated better.
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C 10. Short-term economic gains

O

N may produce long-term environmental Discipline Area Indu

C losses.

E

P

T

Subject Draf

Problem Orientation P

BEHAVIORAL OBJECTIVES

Cognitive: The student will be able to make a working drawing of a project that fulfills a given set of needs.

Affective: The student will be able to analyze a problem.

Skills to be Learned

- A. Project planning
 - 1. Problem analysis
 - 2. Problem solving
 - 3. Working drawing
 - 4. Production
- B. Haste makes waste both time and material

SUGGESTED LEARNING

- I. Student-Centered in class activity
 - A. Show film strip design in wood 2nd half.
 - B. Have class select project to be designed.
 - C. From class discussion develop list of "needs".
 - 1. Where will it be used.
 - 2. How will it be used.
 - 3. What will it hold.
 - 4. What materials.
 - 5. What machines and/or tools available.
 - 6. How much will it cost.
 - D. Depending on groups ability have groups or individuals solve problem.
 - E. Have class discuss and evaluate results.

gains

Industrial Environmental Discipline Area Industrial Arts
Drafting Subject Drafting
Problem Orientation Project Planning Grade 7-12

SUGGESTED LEARNING EXPERIENCES

<p>I. Student-Centered in class activity</p> <ul style="list-style-type: none">A. Show film strip design in wood 2nd half.B. Have class select project to be designed.C. From class discussion develop list of "needs".<ul style="list-style-type: none">1. Where will it be used.2. How will it be used.3. What will it hold.4. What materials.5. What machines and/or tools available.6. How much will it cost.D. Depending on group's ability have groups or individuals solve problem.E. Have class discuss and evaluate results.	<p>II. Outside Resource and Community Activities</p> <ul style="list-style-type: none">A. Local product engineerB. Have students evaluate mass produced items as they differ from individualized items.
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Resource and Reference Materials	Continued and Additional Suggested I n
<u>Publications:</u> <u>Drawing for Product Planning,</u> <u>George E. Stephenson, Chas. A.</u> <u>Bennett Co. 1970</u>	
<u>Audio-Visual:</u> <u>Film strip.</u> <u>Design in Wood, McGraw-Hill</u>	
<u>Community:</u>	

ed L nued and Additional Suggested Learning Experiences

C 11. Individual acts, duplicated
 O or compounded, produce significant
 N C environmental alterations over time.
 P P T

Discipline Area Indust...
 Subject Drafti...
 Problem Orientation Sav...
 and

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING E
I-C	<p><u>Cognitive:</u> The student will understand the amount of time and materials necessary to produce a set of house plans.</p> <p><u>Affective:</u> The student will make use of intermediates to save time and materials.</p>	<p>I. Student-Centered in class activity</p> <p>A. From a set of house plans, discover how many times the same basic drawing is used.</p> <ul style="list-style-type: none"> 1. Floor plan 2. Electric plan 3. Heating plan 4. Plumbing plan 5. Joist layout 6. Sub-floor layout 7. Stud layout <p>B. Discussion on quickest way to produce necessary prints.</p> <p>C. Demonstrate: Intermediates</p> <ul style="list-style-type: none"> 1. Sepia 2. Eraseable sepia 3. Intensifier film 4. Eraseable intensifier film <p>D. Through math calculation find the amount of paper and time saved through the use of an intermediate</p>
ESEA Title III - 59-70-0135-2 Project I-C	Skills to be Learned Use of intermediate.	

Discipline Area Industrial Arts
Subject Drafting - Arch.
Problem Orientation Saving of paper Gradell-12
and time.

<u>SUGGESTED LEARNING EXPERIENCES</u>	
Centered in class	II. Outside Resource and Community Activities

Set of house plans, how many times basic drawing is

plan

eric plan

ng plan

ing plan

layout

floor layout

layout

on on quickest

roduce necessary

ate:

iates

able sepia

ifier film

ole intensifier

ath calculation

amount of paper saved through

an intermediate

<u>Resource and Reference Materials</u>	<u>Continued and Additional Suggestions</u>
<u>Publications:</u> <u>Professional Builder</u> , Sept. 1970 Use of Detailed Layouts to Save On Site Cost	
<u>Audio-Visual:</u> Various intermediates, produced by instructor or previous students.	
<u>Community:</u>	

Continued and Additional Suggested Learning Experiences

C 12. Private ownership must be
 O regarded as a stewardship and should
 C not encroach upon or violate the
 E individual right of others.

Discipline Area
 Subject
 Problem Orientation

ESEA Title III - 59-70-0135-2 Project I-C-E

BEHAVIORAL OBJECTIVES	SUGGESTED LEARN
<u>Cognitive:</u> The student will be able to design a residential dwelling that conforms to local zoning laws. <u>Affective:</u> The student will realize the importance of zoning laws.	I. Student-Centered in class activity A. Presentation and class discussion by a representative of the local zoning committee B. Have students identify zoning laws which will affect their problem C. Students will realize from class discussion and debate how zoning laws protect the rights of others D. Evaluate finished plans in relationship to zoning laws. (local building inspector)
<u>Skills to be Learned</u> Zoning laws protect the rights of others	

ust be

and should Discipline Area Industrial Arts
Date the Subject Drafting - Arch.
cs. Problem Orientation Zoning laws Grade 11-12

SUGGESTED LEARNING EXPERIENCES

<p>I. Student-Centered in class activity</p> <p>A. Presentation and class discussion by a representative of the local zoning committee</p> <p>B. Have students identify zoning laws which will affect their problem</p> <p>C. Students will realize from class discussion and debate how zoning laws protect the rights of others</p> <p>D. Evaluate finished plans in relationship to zoning laws. (local building inspector)</p>	<p>II. Outside Resource and Community Activities</p> <p>A. Zoning Committee Rep.</p> <p>B. Local Building Inspector</p>
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Resource and Reference Materials Continued and Additional

Publications:

General Architectural Drawing,
William E. Wyatt, Chas. Bennett Co.
1969.

Architecture Drafting and
Design, Hepler & McGraw Hill
1965

Soil Surveys and Land Use
Planning, Soil Science
Society of America & American
Society of Agronomy, 1966

Audio-Visual:

Community:

Zoning Commission Representative
Local Building Inspector

Continued and Additional Suggested Learning Experiences

C O N C E P T	<p>1. Energy from the sun, the basic source of all energy, is converted through plant photosynthesis into a form all living things can use for life processes.</p>	<p>Discipline Area <u>Industri</u> Subject <u>Woods</u> Problem Orientation <u>How</u></p>
ESRA Title III -59-70-0135-2 Project R-C-E	<p><u>BEHAVIORAL OBJECTIVES</u></p> <p><u>Cognitive:</u> The student will produce a list of 5 conditions which will result in optimum tree growth.</p> <p><u>Affective:</u> The student will be able to recognize factors which positively and/or negatively affect tree growth and quality.</p> <p><u>Skills to be Learned</u></p> <ol style="list-style-type: none"> 1. Selective cutting 2. Maximum growth 3. Annual Rings pattern (how related to grain pattern) 4. Proper methods of tree placement in planting for greatest growth. 	<p><u>SUGGESTED LEARNING E</u></p> <p>I. Student-Centered in class activity</p> <ol style="list-style-type: none"> 1. Slide presentation showing trees grown in different situations 2. Discussion on presentation <ol style="list-style-type: none"> 1. Which trees showed greatest growth-why. 2. Why didn't other trees show same progress? <ol style="list-style-type: none"> a. Density of growth area. b. Tree management,etc. 3. Offer actual samples for comparison <ol style="list-style-type: none"> 1. Densely planted vs. sparsely planted area (shade effects) 2. Growth of pruned tree vs. neglected tree. 4. Present: (Outside resource) Strength of lumber in relation to growth conditions. 5. Open discussion- tree growth as observed by students.

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ri
rted Discipline Area Industrial Arts
nto Subject Woods
ow use for Problem Orientation How a tree grows Grade 7-12

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity	II. Outside Resource and Community Activities
<ul style="list-style-type: none">a. Slide presentation showing trees grown in different situationsDiscussion on presentation<ul style="list-style-type: none">1. Which trees showed greatest growth-why.2. Why didn't other trees show same progress?<ul style="list-style-type: none">a. Density of growth area.b. Tree management,etc.Offer actual samples for comparison<ul style="list-style-type: none">1. Densely planted vs. sparsely planted area (shade effects)2. Growth of pruned tree vs. neglected tree.Present: (Outside resource) Strength of lumber in relation to growth conditions.Open discussion- tree growth as observed by students.	<ul style="list-style-type: none">1. Forester2. Lumber dealer or representative

Resource and Reference Materials	Continued and Ad
<u>Publications:</u> <u>Life of The Forest</u> , Jack McCormick McGraw-Hill <u>Woodworking for Industry</u> , John L. Feirer, Chas. A. Bennett Co.	F. Have student growth cond G. Suggest and conditions.
<u>Audio-Visual:</u> 1. Teacher made slide series 2. Sample collection 3. Paper Makes Wis. Great, Project I-C-E-, Filmstrip, Teachers guide	
<u>Community:</u> Forester Lumber Dealer	

Ado den ondi and ns.	orce Materials Continued and Additional Suggested Learning Experiences
Jack McCormick stry, John L. nnett Co.	<p>F. Have students inspect own area for tree growth conditions.</p> <p>G. Suggest and carry out methods of improving local conditions.</p>

C 2. All living organisms interact
 C among themselves and their environ- Discipline Area Indus
 C ment, forming an intricate unit called Subject Woods
 P an ecosystem. Problem Orientation Cle

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING
<p><u>Cognitive:</u> The student will clean-up when the clean-up period arrives, and not only completed his responsibility but also check overall results against class developed standard..</p> <p><u>Affective:</u> The student will understand all living systems interact among themselves and their environment, realizing clean-up is a combined effort, not an effort by an individual.</p> <p><u>Skills to be Learned</u></p> <ol style="list-style-type: none"> 1. Co-operation 2. Responsibility 3. Benefits of clean-up <ol style="list-style-type: none"> A. Neat work B. Equipment in proper place. C. Better working atmosphere D. Safer place to work 	<p>I. Student-Centered in class activity</p> <ol style="list-style-type: none"> A. Let clean-up go for one day B. Allow students to work 2nd day in messy area C. Evaluate on 3rd day the need for clean-up and relate it to the shop production and environment. D. Organize schedule of duties and responsibilities stressing teamwork. E. Discuss and compare results of clean-up vs. no clean-up and discuss group inter-action as it relates to clean-up. 	

III-59-70-0135-2 Project Title ESEA Title

discipline Area Industrial Arts
ods Object Woods
Cle problem Orientation Clean-Up Grade 7-12

SUGGESTED LEARNING EXPERIENCES	
I nterested in class Clean-up go for one Students to work in messy area on 3rd day the clean-up and t to the shop on and environ- ment schedule of and responsibilities g teamwork. and compare of clean-up vs. Clean-up and discuss inter-action as it relates to clean-up.	II. Outside Resource and Community Activities 1. Field trip to local manufacturing area to view practical applications and advantages of neat- ness and cleanliness 2. Presentation by industrial commission representative on safety and production as related to neat- ness and teamwork

Resource and Reference Materials	Continued and Additional Suggest
<u>Publications:</u>	
<u>Woodworking for Industry</u> John L. Feirer Chas. A. Bennett Co. <u>Modern Carpentry</u> , Willis H. Wagner, Goodheart-Wilcox <u>General Shop Woodworking</u> , Fryklund & LaEerge McKnight & McKnight.	1. Develop methods of making cl more efficient.
<u>Audio-Visual:</u> <u>Industrial Arts: A Safe Shop</u> University of Ill.	2. Develop list on where else a
	would be beneficial.

Test
Planned and Additional Suggested Learning Experiences
y cl
velop methods of making clean-up responsibility
re efficient.
se a
velop list on where else a team clean-up effort
ould be beneficial.

<p>Project I-C-E</p> <p>ESEA Title III - 59-700135-2</p>	<p>C O N C E P T</p> <p>3. Environmental factors are limiting on the numbers of organisms living within their influence, thus, each environment has a carrying capacity.</p>		
	<p>Discipline Area <u>Industrial Woods</u> Subject <u>Woods</u> Problem Orientation <u>Crowding Shop</u></p>		
	<p>BEHAVIORAL OBJECTIVES</p> <p><u>Cognitive:</u> The student will list and explain three physical and three psychological effects of environmental crowding and relate them to specific shop areas.</p> <p><u>Affective:</u> The student will realize that crowding results in adverse physical and psychological conditions.</p> <p><u>Skills to be Learned</u> Hazards in environmental crowding.</p>		
	<p>SUGGESTED LEARNING EXPERIENCES</p> <p>I. Student-Centered in class activity</p> <p>A. Conduct experiment around following conditions:</p> <ol style="list-style-type: none"> 1. Develop simple task ie, saw off lumber layout and drill 4 holes. 2. Provide only one each of tools required 3. Limit work area to one table. 4. Limit time. 5. Mass production not allowed. 6. First three done win. <p>B. Discuss personal & physical feelings experienced during experiment.</p> <ol style="list-style-type: none"> 1. Low production 2. Confusion 3. Frustration 4. Irritability 5. Waste 6. Injury <p>C. What happens if this happened in town?</p>		

miting

ing Discipline Area Industrial Arts
each Subject Woods
city. Problem Orientation Crowding in the Grade 7-12
Shop

SUGGESTED LEARNING EXPERIENCES	
Student-Centered in class Activity 1. Conduct experiment around following con- ditions: 1. Develop simple task ie, saw off lumber layout and drill 4 holes. 2. Provide only one each of tools required 3. Limit work area to one table. 4. Limit time. 5. Mass production not allowed. 6. First three done win. Discuss personal & physical feelings experienced during experiment. 1. Low production 2. Confusion 3. Frustration 4. Irritability 5. Waste 6. Injury What happens if this hap- pened in town?	II. Outside Resource and Community Activities 1. Psychologist 2. Community Planning Committee. 3. Real Estate Developer

<u>Resource and Reference Materials</u> <u>Publications:</u>	<u>Continued and Additional Suggested</u> <u>at</u> <u>ce</u> D. Relate results experienced during concept #3.
<p><u>Audio-Visual:</u> <u>#53525 Man's Effect on The</u> <u>Environment, University of Ill.</u> <u>Champaign, Ill.</u></p> <p><u>Community:</u></p> <ol style="list-style-type: none"> 1. Psychologist or Sociologist 2. Community Planning Committee 3. Real Estate Developer 	

ted Continued and Additional Suggested Learning Experiences
uris ate results experienced during experiment to
cept #3.

<p>ESEA Title III -59-70-0135-2 Project I-C-E</p>	<p>C 4. <u>An adequate supply of pure water</u> O is essential for life.</p>	
	Discipline Area <u>Indus</u>	
	Subject <u>Wood</u>	
	Problem Orientation <u>Co</u>	
BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING	
<p><u>Cognitive:</u> The student will be able to list five advantages of planting and cutting to control water run off.</p> <p><u>Affective:</u> The student will understand how to control water run off.</p> <p><u>Skills to be Learned</u></p> <ol style="list-style-type: none"> 1. Selective cutting can control water run off. 2. Reforestation practices 3. Run-off control minimizes stream pollution 	<p>I. Student-Centered in class activity</p> <ol style="list-style-type: none"> 1. Class discussion centered around film strips and/or locally produced slides, showing difference of water run off on properly cut and planted versus improperly cut and planted. 2. Discussion by local forester about how selective cutting can control run off and improve tree stand (possible field trip) 3. Follow-up. Run tests of lakes and streams with and without protection of trees and evaluate results. Question: Would reforestation minimize problem? 	

Discipline Area Industrial Arts

Subject Woodworking

Problem Orientation Control of Water Grade 7-12
Run-Off

SUGGESTED LEARNING EXPERIENCES

nt-Centered in class ity ass discussion centered ound film strips and/or cally produced slides, owing difference of water n off on properly cut d planted versus inappropri- ly cut and planted. scussion by local forest about how selective cutt- g can control run off d improve tree stand ossible field trip) llow-up. n tests of lakes and reams with and without tection of trees and luate results. question: Would reforest- ion minimize problem?	II. Outside Resource and Community Activities 1. Planting trees 2. Helping in selective cutting 3. Long term--check on water quality as checked by planting 4. Long term--photo- graph 5. Student developed slide series of local conditions 6. Field trip with local forester
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Resource and Reference Materials	Continued and additional Suggested Learning Activities
<u>Publications:</u>	<ol style="list-style-type: none"> 1. Revegetate a stream (under direction of the Soil Conservation Service Dept.) to control water run-off. 2. Clean out a local stream.

Audio-Visual:

Teacher/student developed
slide series
#01893 Forest Products
University of Ill, Champaign, Ill

Community:

1. DNR
- 2 ASCS

Learn and additional Suggested Learning Experiences
Construct a stream (under direction of Conservation
.) to control water run-off.
Clean out a local stream.

C 5. An adequate supply of clean
 O air is essential because most Discipline Area Indust
 N organisms depend on oxygen, through Subject Woodw
 C respiration, to release the energy Problem Orientation R
 E in their food. Clean Ai

BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING
<u>Cognitive:</u> The student will be able to list five health hazards due to air pollution in a woodworking shop. <u>Affective:</u> The student will take preventive measures to stop air pollution when working with wood.	I. Student-Centered in class activity A. Dust collection system will not be used for a one day period to show students how dust will collect on projects, clothes, tools and machines. B. During next working period dust collector will be used and students will <u>observe</u> difference in working conditions. C. Student-small group, busy session.
<u>Skills to be Learned</u> Ways to reduce air pollution in a shop environment.	

of clean
the most
through
the energy
Problem Orientation Relationship of Grade 7-12
Clean Air to Health

SUGGESTED LEARNING EXPERIENCES	
<p>I. Student-Centered in class activity</p> <p>A. Dust collection system will not be used for a one day period to show students how dust will collect on projects, clothes, tools and machines.</p> <p>B. During next working period dust collector will be used and students will <u>observe</u> difference in working conditions.</p> <p>C. Student-small group, busy session.</p>	<p>II. Outside Resource and Community Activities</p> <p>Inspector from State Dept. of Labor, Management and Human Relations.</p>

<u>Resource and Reference Materials</u>	<u>Continued and Additional</u>
<u>Publications:</u>	

Audio-Visual:

Community:

Local Representative of Dept. of
Labor, Management and Human
Relations.

al S als | Continued and Additional Suggested Learning Experiences

of

C 6. Natural resources are not equally
 O distributed over the earth or over Discipline Area Industr
 N time and greatly affect the geo- Subject Woods
 C graphic conditions and quality of Problem Orientation Lumbe
 E life. ty

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING E
<p><u>Cognitive:</u> Student will research, create, and compare itemized cost sheets of lumber 20 years ago, 10 years ago, and the present time. Students will then present their findings to the class via oral report and visual aid.</p> <p><u>Affective:</u> Student will be able to see monetary effect of diminishing resources and resource location in the lumbering industry.</p> <p><u>Skills to be Learned</u></p> <ol style="list-style-type: none"> 1. Cost analysis 2. Timber forest and lumbering locations 3. Graphic illustrations 4. Cause-effect thinking 		<p>I. Student-Centered in class activity</p> <p>A. Discuss cost sheets</p> <ol style="list-style-type: none"> 1. What is included 2. Format <p>B. Have students compile cost sheets of 20, 10, and 1 year ago for a standard article in local area</p> <p>C. Discuss local area cost sheets, comparing cost fluctuations and probable causes over the years.</p> <ol style="list-style-type: none"> 1. Availability 2. Forest management 3. Demand 4. Additional expenses <p>D. Compare and discuss: Local area cost sheets versus cost sheets from other geographical area. (teacher furnished) Discuss reasons for variations.</p> <ol style="list-style-type: none"> 1. Location 2. Transportation <p>(Con't)</p>

ESSEA Title III -59-70-0135-2 Project I-C-E

equally

str over Discipline Area Industrial Arts
s geo- Subject Woods
mbe ty of Problem Orientation Lumber Cost Increases Grade 7-12

SUGGESTED LEARNING EXPERIENCES	
II. Student-Centered in class activity 1. Discuss cost sheets 1. What is included 2. Format 3. Have students compile cost sheets of 20,10, and 1 year ago for a standard article in local area 4. Discuss local area cost sheets, comparing cost fluctuations and probable causes over the years. 1. Availability 2. Forest management 3. Demand 4. Additional expenses 5. Compare and discuss: Local area cost sheets versus cost sheets from other geographical area. (teacher furnished) Discuss reasons for variations. 1. Location 2. Transportation (Con't)	II. Outside Resource and Community Activities 1. D.N.R. Representative 2. Forest manager 3. Local lumber dealer 4. Contractor

Resource and Reference Materials	Continued and Additional Sugges
<u>Publications:</u>	(Con't from D)
<p>Catalogs from lumber dealers.</p> <p><u>Woodworking for Industry,</u></p> <p>John L. Feirer, Chas. A Bennett Co</p> <p><u>General Shop Woodworking,</u> FryKlund</p> <p>& La Berge, McKnight & McKnight</p>	<p>3. Forest management</p> <p>4. Demand</p>
<u>Audio-Visual:</u>	
<u>Community:</u>	
Local lumber dealers	

est

ials Continued and Additional Suggested Learning Experiences

(Con't from D)

- 3. Forest management
- 4. Demand

ett Co
y Kluna
ght

C O N C E P T I-C-E ESEA Title III - 59-70-0135-2 Project	<p>7. Factors such as facilitating transportation, economic conditions population growth, and increased leisure time have a great influence on changes in land use and centers of population density.</p>	Discipline Area Subject Problem Orientation Leis	Industrial Woodwork nc rs
		BEHAVIORAL OBJECTIVES	SUGGESTED LEARNING I
	<p><u>Cognitive</u>: The student will be able to list 10 new businesses and industries created by the do-it-yourself concept.</p> <p><u>Affective</u>: The student will make better use of his leisure time through the use of do-it-yourself woodworking projects.</p> <p><u>Skills to be Learned</u></p> <p>Efficient use of leisure time.</p> <p>Research.</p>	<p>I. Student-Centered in class activity</p> <p>A. Students will research how the do-it-yourself leisure activities have changed industries, transportation, and population centers, by means of:</p> <ol style="list-style-type: none"> 1. Personal interview-local industrialist, businessmen, etc. 2. Magazine/newspaper reading. 3. Books. 4. A-V materials. 5. Letters of inquiry to various companies. 6. Small-group brainstorming. 	II.

stri ons Discipline Area Industrial Arts
work Subject Woodworking
leis ure Problem Orientation Leisure Time Grade 9-12
rs

SUGGESTED LEARNING EXPERIENCES	
II. Student-Centered in class activity Students will research how the do-it-yourself leisure activities have changed industries, transportation, and population centers, by means of: - Personal interview- local industrialist, businessmen, etc. - Magazine/newspaper reading. - Books. - A-V materials. - Letters of inquiry to various companies. - Small-group brainstorming.	II. Outside Resource and Community Activities Local building supply dealers. Operators of craft and hobby shops.

Resource and Reference Materials Continu' and Additional Suggesste

Publications:

Do-It-Yourself Encyclopedia
Project plan books
Magazines, Better Homes &
Gardens, etc.

Audio-Visual:

Community:

Local building supply dealer.
Local hobby & craft shop
personal.

Continued and Additional Suggested Learning Experiences

C 8. Cultural, economic, social, and
 O political factors determine status
 N of man's values and attitudes
 C
 E
 P
 T toward his environment.

Discipline Area Industrial

Subject Woods

Problem Orientation Economical
material

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING EXP
ESEA Title III -59-70-0135-2 Project I-C-F	<p><u>Cognitive:</u> The student will resaw lumber for his project whenever possible.</p> <p><u>Affective:</u> The student will realize that resawing lumber for panels saves not only materials but also money thus <u>minimizing waste</u>.</p> <p><u>Skills to be Learned</u></p> <ol style="list-style-type: none"> 1. Use of the bandsaw for resawing 2. Project planning for resawing. 	<p>I. Student-Centered in class activity</p> <p>A. Class discussion of how can the material we use in the shop be used most economically in the following areas:</p> <ol style="list-style-type: none"> 1. Project design (Standard Material) 2. Material Layout (Minimize waste) 3. Reworked material (Resawing) <p>B. Bandsaw demonstration</p> <ol style="list-style-type: none"> 1. Resawing <ol style="list-style-type: none"> A. Blade width B. Fence C. Feather board 2. Handling resawed mat'r'l <ol style="list-style-type: none"> A. Gluing & clamping B. Surfacing 3. Design alternatives with resawed mat'r'l

1, and

ial status Discipline Area Industrial Arts
s Subject Woods
nom Problem Orientation Economic use of material Grade 8-12

SUGGESTED LEARNING EXPERIENCES	
A.	Student-Centered in class activity
A.	A. Class discussion of how can the material we use in the shop be used most economically in the following areas: 1. Project design (Standard Material) 2. Material Layout (Minimize waste) 3. Reworked material (Resawing)
B.	B. Bandsaw demonstration 1. Resawing A. Blade width B. Fence C. Feather board 2. Handling resawed mat'r'l A. Gluing & clamping B. Surfacing 3. Design alternatives with resawed mat'rl
	II. Outside Resource and Community Activities A. Local shop owners talk about reusable material in their business. B. Chamber of Commerce list of areas businesses Student evaluate which produce the "most useless" wastes.

Resource and Reference Materials	Continued and Additional Suggested Le
<u>Publications:</u> <u>Woodworking for Industry,</u> John L. Feirer Chas. A. Bennett Co. <u>Exploring Woodworking,</u> Fred W. Zimmerman Goodheart-Willcox	
<u>Audio-Visual:</u> BAVI #2640 Danish Design #03230 <u>Man and The Forest</u> , Part 1 #03370 <u>Man and the Forest</u> , Part 2 University of Ill.	

Related and Additional Suggested Learning Experiences



C
O
N
C
E
P
T
9. Man has the ability to manage,
manipulate, and change his
environment.

Discipline Area In

Subject Wo

Problem Orientation

BEHAVIORAL OBJECTIVES		SUGGESTED LEARN
<u>Cognitive:</u> The student will be able to graph how a tree will produce immensely more under growing conditions manipulated by man. <u>Affective:</u> The student will be able to plant, and care for trees in a manner which will produce maximum growth.		I. Student-Centered in class activity A. Presentation by the D.N.I. on how man is manipulating the environment in which a tree grows to produce maximum yield.
ESEA Title III -59-70-0135-2 Project I=C-E	<u>Skills to be Learned</u> How to produce trees that will yield maximum material in the shortest growing time possible.	

Discipline Area Industrial Arts

Subject Woodworking

Problem Orientation Super Trees Grade 9-12

SUGGESTED LEARNING EXPERIENCES

nt-Centered in class

ity
esentation by the D.N.R.
how man is manipulating
the environment in w'ich
tree grows to prod
ximum yield.

II. Outside Resource and
Community Activities

A. Field trip to an
area such as the:

1. Seed Orchard
2. Nicolet National
Forest, East of
Langlade, Wi.
Highway 64.
3. Tree farms operated
by paper mills
and lumber companies

B. D.N.R.

Resource and Reference Materials | Continued and Additional Sugges
Publications:

Exploring Woodworking,
Fred W. Zimmerman
Goodheart-Willcox
General Shop Woodworking,
FryKlund & LaBerge
McKnight & McKnight
Woodworking for Industry,
John L. Feirer
Chas. A. Bennett Co.

Audio-Visual:

52386 Conservation in Our
Forest
#01889 Forest Conservation,
University of Ill. Champaign, Ill.

Community:

D.N.R.

ges : Additional Suggested Learning Experiences

C 10. Short-term economic gains may
O produce long-term environmental
N C losses.
E P T

Discipline Area Industrial Arts
Subject Woods
Problem Orientation Quality Control

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING ACTIVITIES
<p><u>Cognitive</u>: The student will list 10 conditions which effect the quality of a saw log.</p> <p><u>Affective</u>: The student will become aware of the adverse effects of cutting for pure profit.</p>		<p>I. Student-Centered in class activity</p> <p>A. Develop a collection of boards which contain defects which effect the grade of the board</p> <ol style="list-style-type: none">1. Natural defects<ol style="list-style-type: none">a. Knotsb. Wanesc. Shakesd. Natural holese. Staining2. Man made defects<ol style="list-style-type: none">a. Splitsb. Crackingc. Checkingd. Honeycombinge. Casehardeningf. Man made holesg. StainingB. Discuss what happened to cause the various defects.C. Were these defects a result of "Rushing?" (Con't)
<p><u>Skills to be Learned</u></p> <p>Forest management</p> <ol style="list-style-type: none">A. Selective cuttingB. Proper pruning or trimmingC. Use of a crushing stick		

ESEA Title III - 59-70-0135-2 Project I-C-E

ns may

tal

Discipline Area Industrial Arts

Subject Woods

Problem Orientation Production of quality saw logs Grade 7-12

SUGGESTED LEARNING EXPERIENCES

Student-Centered in class activity

A. Develop a collection of boards which contain defects which effect the grade of the board

1. Natural defects
 - a. Knots
 - b. Wanes
 - c. Shakes
 - d. Natural holes
 - e. Staining
2. Man made defects
 - a. Split
 - b. Cracking
 - c. Checking
 - d. Honeycombing
 - e. Casehardening
 - f. Man made holes
 - g. Staining
- B. Discuss what happened to cause the various defects.
- C. Were these defects a result of "Rushing?" (Con't)

II. Outside Resources and Community Activities

Resource and Reference Materials	Continued and Additional Sugg.
Publications:	(Con't from I.)
<u>Woodworking for Industry</u> ,	D. How can growing quality be
John L. Feirer	E. Presentation by local fore
Chas. A. Bennett Co.	F. Develop slide series of w
<u>Exploring Woodworking</u> ,	the "quick buck" VS. cut
Fred W. Zimmerman	
Goodheart-Willcox	
<u>Cabinetmaking & Millwork</u> ,	
John L. Feirer	
Chas. A. Bennett Co.	
Audio-Visual:	
<u>#81995 Working Forest</u>	
University of Ill.	
Teacher developed slide	
<u>Community:</u>	
Local forester	

Continued and Additional Suggested Learning Experiences

't from I.)

How can growing quality be controlled?

Presentation by local forest ranger.

Develop slide series of wood lots--cut for

the "quick buck" VS. cut for management.

C 1. Individual acts, duplicated
 O or compounded, produce significant
 E environmental alterations over
 P time.

Discipline Area Industrial
 Subject Woods
 Problem Orientation Material
 Waste

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING EXP
<p><u>Cognitive</u>: The student will select material and work with it in a manner that results in minimum or zero waste.</p> <p><u>Affective</u>: The student will realize that efficient use and careful workmanship reduces waste and results in savings.</p> <p><u>Skills to be Learned</u></p> <ol style="list-style-type: none"> 1. Efficient use of materials 2. Working allowance <ol style="list-style-type: none"> A. Hand tools B. Machine 3. Multiplied waste 4. Multiplied carelessness. (scrap/rejects) 	<p>I. Student-Centered in class activity</p> <p>A. Class discussion of working allowance (Poem) "Half an inch longer 'tis we saw Quarter of an inch wider is the law An eighth on thickness is enough Where sawing lumber from the rough."</p> <p>B. Students will lay-out assigned projects on paper representing 4x8 plywood calculate % of waste</p> <p>C. Discuss waste multiplier for both boards versus plywood--% of rejects</p> <p>D. Students will go to local lumber yard and obtain price lists to realize the amount of money spent for waste.</p>	<p>II. O C A D</p>

Project I-C-1
 ESEA Title III -59-70-0135-2

Discipline Area Industrial Arts

Subject Woods

Problem Orientation Material Use Vs. Grade 7-12
Waste

SUGGESTED LEARNING EXPERIENCES

Centered in class discussion of allowance (Poem) an inch longer 'tis saw er of an inch wider the law ighth on thickness enough sawing lumber n the rough." ents will lay-out yned projects on representing lywood calculate waste ss waste multiplier oth boards versus ood--% of rejects ents will go to local er yard and obtain e lists to realize amount of money t for waste.	II. Outside Resource and Community Activities A. Quality control engineer B. D.N.R.--wood use
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Resource and Reference Materials	Continued and Additional Suggestions
<u>Publications:</u>	1. Students will redesign projects using materials thereby, freeing them for other uses.
<u>Woodworking for Industry</u> , John L. Feirer Chas. A. Bennett Co.	
<u>Cabinetmaking and Millwork</u> , John L. Feirer Chas. A. Bennett Co.	
<u>Exploring Woodworking</u> , Fred W. Zimmerman Goodheart-Willcox	
<u>Audio-Visual:</u>	
#50750 <u>American Sawmill</u> #03230 <u>Land and The Forest</u> Part 1, University of Ill.	
<u>Community:</u>	
Quality control engineer D.I.R.	

est ojo g :	<p><u>Continued and Additional Suggested Learning Experiences</u></p> <p>1. Students will redesign projects to use less materials thereby, freeing materials for other uses.</p>
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C	<u>12. Private ownership must be regarded</u>	Discipline Area	In
O	<u>as a stewardship and should not</u>	Subject	W
N	<u>encroach upon or violate the</u>		
C	<u>individual right of others,</u>	Problem Orientation	

BEHAVIORAL OBJECTIVES		SUGGESTED LEARN
Cognitive: The student will develop and defend a code or law for a given tract of land which reflects "proper" land use.	Affective: The student will know how building codes and zoning laws affect and dictate land use.	I. Student-Centered in class activity A. Discuss how building codes & zoning laws dictate land use 1. Land Use (type of area) <ul style="list-style-type: none"> a. Commercial b. Residential c. Recreational 2. Building placement 3. Building spacing
Skills to be Learned		B. Discuss reasons behind building code regulations 1. How do they benefit people? <ul style="list-style-type: none"> a. Planners b. Builders c. Residents 2. How do they hinder people? <ul style="list-style-type: none"> a. Planners b. Builders c. Residents
ESEA Title III - 59-70-0135-2 Project L.C.		C. Discuss correlation between good building codes and zoning laws and good environmental and ecological conditions.

egarded

Discipline Area Industrial Arts

Subject Woods - Building Trades

Problem Orientation Building Codes & Grade 9-12
Zoning Laws

SUGGESTED LEARNING EXPERIENCES

Student-Centered in class activity	Outside Resource and Community Activities
Discuss how building codes & zoning laws dictate land use	A. Local Govt. official to explain reasoning behind codes & zoning
1. Land Use (type of area) a. Commercial b. Residential c. Recreational	B. Zoning commissioner, town or village official
2. Building placement	C. Local building inspector
3. Building spacing	D. Architect
Discuss reasons behind building code regulations.	E. Local contractor
1. How do they benefit people? a. Planners b. Builders c. Residents	F. Safety & sanitation inspector
2. How do they hinder people? a. Planners b. Builders c. Residents	G. N.D.R. Representatives and films concerning "before & after development"
Discuss correlation between good building codes and resulting zoning laws and good resulting environmental and ecological conditions.	

Resource and Reference Materials	Continued and Additional Sugg
<p>Publications:</p> <p><u>Modern Carpentry</u>, Willis H. Wagner Goodheart-Willcox</p> <p><u>Architecture Drafting and Design</u> Hepler & Wallach, McGraw Hill</p>	<p>Develop easy reference chart codes and zoning laws.</p>
<p><u>Audio-Visual:</u></p> <p><u>Small Cities: How They Grow</u> University of Ill.</p>	
<p><u>Community:</u></p> <p>All sources listed under "Outside Resources and Community Activities" on reverse side.</p>	

Materials	<u>Continued and Additional Suggested Learning Experiences</u> Develop easy reference chart for basic building codes and zoning laws.
Land Design Hill	
Row	
Community Wide.	

C 1. Energy from the sun, the
 O basic source of all energy, is Discipline Area In
 N converted through plant photosyn- Subject Me
 C thesis into a form all living things problem Orientation
 E can use for life processes.

BEHAVIORAL OBJECTIVES		SUGGESTED LEARN
<u>Cognitive:</u> The student will be able to explain, in writing, how oxygen is used in the welding and cutting process. <u>Affective:</u> The student will understand the use of oxygen in the welding and cutting process.		I. Student-Centered in class activity A. Class discussion on how oxygen is produced in nature through photosynthesis and commercially through electrolysis. B. Experiment showing how a candle will burn in the presence of oxygen and go out as oxygen is used. C. Relate experiment to flame cutting process. D. Develop relation of electrolysis to sun energy
<u>Skills to be Learned</u> How oxygen is produced. How oxygen is used in the welding process.		

ISSEA Title III -59-70-0135-2 Project I-C-E

rom the sun, the

In of all energy, is Discipline Area Industrial Arts
Me rough plant photosyn- Subject Metals
on to form all living things Problem Orientation Oxygen Production Grade 9-12
life processes.

OBJECTIVES	SUGGESTED LEARNING EXPERIENCES	
Student explain, oxygen lding ss. udent he use welding ss.	I. Student-Centered in class activity A. Class discussion on how oxygen is produced in nature through photo- synthesis and commercially through electrolysis. B. Experiment showing how a candle will burn in the presence of oxygen and go out as oxygen is used. C. Relate experiment to flame cutting process. D. Develop relation of electrolysis to sun energy?	II. Outside Resource and Community Activities Local welding supply house.

Resource and Reference Materials	Continued and Additional Suggested Lear
<u>Publications:</u> Available from welding supply houses for the asking: <u>Oxyacetylene Welding and Cutting</u> , Stuart Plumley McGraw Hill	
<u>Audio-Visual:</u> Flame charts	
<u>Comparative:</u> Rep. from local welding supply house.	

aterials | Continued and Additional Suggested Learning Experiences

upply

upply

C 2. All living organisms interact
 O among themselves and their
 II environment, forming an intricate
 C unit called an ecosystem.

Discipline Area Industrial

Subject Metals

Problem Orientation Class

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING
<p><u>Cognitive</u>: The student will clean-up when the clean-up period arrives, and not only do his responsibility but also check overall results.</p> <p><u>Affective</u>: The student will understand all living systems interact among themselves & their environment realizing clean-up is a combined effort not an effort by an individual.</p>		<p>I. Student-Centered in class activity</p> <ol style="list-style-type: none"> 1. Let clean-up go for one day. 2. Allow students to work next day in messy area. 3. Evaluate on third day the need for clean-up and relate to shop production and environment. 4. Organize schedule of duties and responsibilities stressing teamwork 5. Discuss and compare results of clean-up versus no clean-up and group interaction as related to clean-up.
<p><u>Skills to be Learned</u></p> <ol style="list-style-type: none"> 1. Cooperation 2. Responsibility 3. Benefits of clean-up <ol style="list-style-type: none"> A. Neater work B. Equip. in proper place. C. Better working atmosphere D. Safer place to work. 		II.

ns interact
eir
intricate
em.
Discipline Area Industrial Arts
Subject Metals
Problem Orientation Clean-up Grade 7-12

SUGGESTED LEARNING EXPERIENCES

<p>I. Student-Centered in class activity</p> <ol style="list-style-type: none">1. Let clean-up go for one day.2. Allow students to work next day in messy area.3. Evaluate on third day the need for clean-up and relate to shop production and environment.4. Organize schedule of duties and responsibilities stressing teamwork5. Discuss and compare results of clean-up versus no clean-up and group interaction as related to clean-up.	<p>II. Outside Resource and Community Activities</p> <ol style="list-style-type: none">1. Field trip to local manufacturing area to view practical applications and advantages of neatness and cleanliness.2. Presentation by industrial commission representative on safety & production as related to neatness & teamwork.
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Resource and Reference Materials	Continued and Additional
<u>Publications:</u>	
<u>Metalwork Technology and Practice</u> Ludwig & McCarthy	1. Develop methods of responsibility more
<u>McKnight & McKnight</u>	2. Develop list of places to clean-up effort work
<u>Forging & Welding</u> , Robert E. Smith	
<u>McKnight & McKnight</u>	
<u>Metalworking</u> , T. Gardner Boyds	
<u>Audio-Visual:</u>	
<u>Industrial Arts: A Safe Shop</u> , University of Ill.	
<u>Community:</u> Safety inspector industrial commission.	

on and Additional Suggested Learning Experiences

of develop methods of making clean-up
more responsibility more efficient.

pl Develop list of places where a team
wo clean-up effort would be beneficial.

C 3. Environmental factors are
O limiting on the numbers of organisms Dis
M living within their influence, Sub
C thus, each environment has a Pro
P
T carrying capacity.

BEHAVIORAL OBJECTIVES

Cognitive: The student will list and explain 3 physical and 3 psychological effects of environmental crowding and relate them to specific areas.
Affective: The student will realize that crowding results in adverse physical & psychological conditions.

Skills to be Learned
Hazards in environmental crowding.

I. Student-Cent activity
1. Conduct e around fo condition
A. Develop ie. sa layout holes
B. Provide each o
C. Limit a one tal
D. Limit t
E. Mass pr allowed
F. First a win
2. Discuss po feelings o experiment
A. Low pr
B. Confusio
C. Frustra
D. Irritab
E. Waste
(Con't)

ESMA title III -59-70-0135-2 Project I-C-1

are
Dis organisms Discipline Area Industrial Arts
Sub nce, Subject Metals
Pro a Problem Orientation Crowding in Shop Grade 7-12

SUGGESTED LEARNING EXPERIENCES

<p>ent t e fo ion elop sa out es vide h o it tal it s pr ow st s po gs ment pro fusi stra titat ce</p> <p>Student-Centered in class activity</p> <ol style="list-style-type: none">1. Conduct experiment around following conditions:<ol style="list-style-type: none">A. Develop simple task ie. saw off stock layout & drill 4 holesB. Provide only one each of tools requiredC. Limit work area to one tableD. Limit timeE. Mass production not allowedF. First three finished win2. Discuss personal & physical feelings experienced during experiment.<ol style="list-style-type: none">A. Low productionB. ConfusionC. FrustrationD. IrritabilityE. Waste <p>(Con't)</p>	<p>II. Outside Resource and Community Activities</p> <ol style="list-style-type: none">1. Psychologist2. Community planning committee3. Real estate developer
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Resource and Reference Materials	Continued and Additional Suggestions
<u>Publications:</u>	<p>(Con't from I.)</p> <p>3. What happens if this happens? A. Slums B. Urban crowding</p> <p>4. Relate experienced results to</p>

Audio-visual:
53525 Plan's Effect on The Environment, University of Ill., Champaign, Ill.

Community:
 Psychologist or Sociologist.
 Community planning comm.
 Real estate developer

ges and Additional Suggested Learning Experiences

(I.)

ene happens if this happened in town?

crowding
s to experienced results to concept #3.

C - 4. An adequate supply of
 O pure water is essential for life.
 C
 E
 P
 T

Discipline Area Industrial
 Subject Metals
 Problem Orientation Pure Wa
Manufac

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING EXPERIENCES	
Cognitive: The student will be able to list 5 methods in which waste water is treated in the metals industry. Affective: The student will understand how waste water in metal manufacturing is processed to purify it to standards.	Skills to be Learned 1. How water is used in manufacturing 2. How waste water quality is maintained 3. Water quality standards	II. Student-Centered in class activity A Field trip to gain knowledge of water use in manufacturing. B Group discussion 1. How water used in the manufacture & processing of metals? 2. Is the water "pure" when you are finished with it? 3. (Yes) What is being done to accomplish this? 4. (No) What can be done to accomplish this? 5. Is water recycled thru the process or only used once----why? 6. Is water sent thru local sewage treatment plant? Why-Why not?	III. Out Co A. B. C. D.

ial Discipline Area Industrial Arts

Subject Metals

Problem Orientation Pure Water & Manufacturing Grade 7-12

SUGGESTED LEARNING EXPERIENCES

Out-Cent-Centered in class
Community
Field trip to gain
knowledge of water use
in manufacturing.
Group discussion
How water used in
the manufacture &
processing of metals?
Is the water "pure"
when you are finished
with it?
(Yes) What is being
done to accomplish
this?
(No) What can be done
to accomplish this?
Is water recycled thru
the process or only
used once---why?
Is water sent thru
local sewage treatment
plant? Why-Why not?

II. Outside Resource and
Community Activities

- A. Visit local plants
& see how water is
used in processing
and/or manufacturing
of metal.
- B. Visit local sewage
treatment plant &
have engineer explain
problems related to
treatment of industrial waste.
- C. D.N.R. representative
- D. Chemistry inst.

Resource and Reference Materials

Publications:

Forging and Welding,
Robert E. Smith
McKnight & McNight.
Metalwork: Technology & Practice,
Oswald A. Ludwig
McKnight & McNight

Continued and Additional Suggested Learn

1. Students will write and report on wa treatment process. Be prepared to ex effects of water moving different so testing the results.
2. Set up a model sediment pond using t contrasting soils ie. sand, gravel, Test the purity of the water before piercing thru soil.

Audio Visual:

Community:

1. D.N.R.
2. Local sewage engineer.
3. Local manufacturer
large quantities of water.

earn d Additional Suggested Learning Experiences

n wa will write and report on water
o ex t process. Be prepared to explain
t so of water moving different soils &
the results.

ng t model sediment pond using three
el, ing soils ie. sand, gravel, & clay.
ore purity of the water before & after
thru soil.

C 5. An adequate supply of clean air
 O is essential because most organisms Discipline Area Industrial
 C depend on oxygen, through respiration, Subject Metals
 P T to release the energy in their Problem Orientation Dealing
 T food. Welding Fu

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING EXP
<u>Cognitive:</u> The student will express in writing the toxic effects of the fumes produced in welding. <u>Affective:</u> The student will turn on the exhaust system before welding, realize what ideal conditions are desired, use conservatively.		I. Student-Centered in class activity A. Demonstrate various welding techniques & observe visible fumes produced. B. Discuss where these fumes come from, & what their effect is on an individual. (Guest speaker if desired) C. Have member of industrial commission explain how such fumes are dealt with in industry. D. Discuss & brainstorm how fumes can be dealt with in the school shop area.
<u>Skills to be Learned</u> 1. Effects of welding fumes on an individual. 2. How toxic fumes are handled in industry. 3. How toxic fumes are & can be handled in the shop.		

of clean air

host organisms Discipline Area Industrial Arts

through respiration, Subject Metals

in their Problem Orientation Dealing With Toxic Grade 9-12
Future Welding Fumes

SUGGESTED LEARNING EXPERIENCES

<p>I. Student-Centered in class activity</p> <ul style="list-style-type: none">A. Demonstrate various welding techniques & observe visible fumes produced.B. Discuss where these fumes come from, & what their effect is on an individual. (Guest speaker if desired)C. Have member of industrial commission explain how such fumes are dealt with in industry.D. Discuss & brainstorm how fumes can be dealt with in the school shop area.	<p>II. Outside Resource and Community Activities</p> <ul style="list-style-type: none">A. Industrial Commission representative.B. School chemistry teacher.C. Local welding or metal fabricating person.
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Resource and Reference Materials	Continued and Additional Sug
<u>Publications:</u> <u>Forging and Welding</u> , Robert E. <u>Smith, McKnight & McKnight</u> <u>Oxyacetylene Welding and Cutting</u> , <u>Stuart & Plumley</u> <u>McGraw Hill</u>	
<u>Audio-Visual:</u> <u>Oxyacetylene Welding:</u> <u>Safety and Operations</u> <u>#53445 University of Ill.</u>	
<u>Community:</u> <u>Industrial Commission Rep.</u> <u>School chemistry teacher</u> <u>Local welder</u> <u>Local welding supplier</u>	

tinued and Additional Suggested Learning Experiences

C 6. Natural resources are not
 O equally distributed over the earth
 C or over time and greatly affect
 E the geographic conditions and
 P quality of life.

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 Subject Metall
 Problem Orientation S

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING
<p>Cognitive: The students will be able to identify 5 adverse conditions created by strip mining.</p> <p>Affective: Students will become aware of how strip mining affects geographic conditions.</p> <p>Skills to be Learned</p> <ol style="list-style-type: none"> 1. Ecological management of strip mining. 2. Methods of mining raw ore & its effect on our environment. 		<p>I. Student-Centered in class activity</p> <p>A. Research the following aspects of strip mining</p> <ol style="list-style-type: none"> 1. Site selection 2. Site development 3. Community involvement 4. Side effects <ol style="list-style-type: none"> a. Physical b. Social c. Mental <p>B. Field trip and/or movie/ film strip/slides to experience how strip mines are being "Re-cycled" for better land use.</p> <p>C. Discuss effects of mining in relationship to community.</p> <ol style="list-style-type: none"> 1. How these materials help us? 2. How present mining techniques destroy natural environment. 3. Possible alternatives and/or improved processes

ESPA Title III -59-70-0135-2 Project I-C-E

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over the earth

Discipline Area Industrial Arts

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Subject Metals

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Problem Orientation Strip mining & Grade 7-12
its effects

IVES	SUGGESTED LEARNING EXPERIENCES	
ts will ated il rip nic at st led ng un- s esse	<p>I. Student-Centered in class activity</p> <p>A. Research the following aspects of strip mining</p> <ol style="list-style-type: none">1. Site selection2. Site development3. Community involvement4. Side effects<ol style="list-style-type: none">a. Physicalb. Socialc. Mental. <p>B. Field trip and/or movie/film strip/slides to experience how strip mines are being "Re-cycled" for better land use.</p> <p>C. Discuss effects of mining in relationship to community.</p> <ol style="list-style-type: none">1. How these materials help us?2. How present mining techniques destroy natural environment.3. Possible alternatives and/or improved processes.	<p>II. Outside Resource and Community Activities</p> <p>A. Field trip to open pit and/or strip mine to see mining operations and to question about land reclamation.</p> <p>B. Library research</p> <p>C. D.W.R.</p>

Resource and Reference Materials	Continued and Additional
<u>Publications:</u> <u>Forging and Welding,</u> <u>Robert E. Smith</u> <u>McKnight & McKnight</u> <u>Encyclopedias</u>	<u>I. Develop slide series a</u> <u>"Good vs Bad" strip em</u>
<u>Audio-Visual:</u> <u>Mining for Nickel,</u> <u>Rothacker Motion Picture</u> <u>241 W. 17th St., New York, N. Y.</u>	
<u>Continuous Excavating,</u> <u>New Concept in Mining</u> <u>Hole, Bigger, Deeper Blast</u> <u>Hole Drills, Ideal Pictures</u> <u>4431 W. North, Milwaukee, Wis.</u>	
<u>Community:</u> <u>1. D.E.R.</u> <u>2. Local strip mine</u>	

al S	Materials	Continued and Additional Suggested Learning Experiences
es a		1. Develop slide series and/or picture set of "Good vs Bad" strip mining.

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7. Factors such as facilitating

transportation, economic conditions, Discipline Area I

population growth, and increased

Subject

leisure time have a great influence on changes in land use and centers of population density.

BEHAVIORAL OBJECTIVES

SUGGESTED LEA

Cognitive: The student will be able to list new businesses and industries created by the do-it-yourself concept & more available leisure time.
Affective: The student will make better use of his leisure time through the use of do-it-yourself projects.

Skills to be Learned

1. Efficient use of leisure time.
2. How leisure time effects land use.

I. Student-Centered in class activity

- A. Students will research how the do-it-yourself & leisure activities have changed industries transportation & population centers.
- B. Discuss how the sale of RV's have made an impact on the metals industry.
- C. What role is industrial arts providing in basic skills for the do-it-yourself concept-- specifically in metals area?

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uch as facilitating

a. Industrial, economic conditions, Discipline Area Industrial Arts
b. Population growth, and increased Subject Metals
c. Land use and centers have a great influence Problem Orientation Leisure Time Grade 7-12
density. Effects Land Use

LEARNING OBJECTIVES	SUGGESTED LEARNING EXPERIENCES
	<p>I. Student-Centered in class activity</p> <p>A. Students will research how the do-it-yourself & leisure activities have changed industries, transportation & population centers.</p> <p>B. Discuss how the sale of RV's have made an impact on the metals industry.</p> <p>C. What role is industrial arts providing in basic skills for the do-it-yourself concept-- specifically in metals area?</p> <p>II. Outside Resource and Community Activities</p> <p>A. Local building supply dealer.</p> <p>B. Local recreational vehicle dealer, ie</p> <ul style="list-style-type: none">1. Pickups2. Snowmobiles3. Minibikes4. ATV's5. Boats

Resource and Reference Materials Continued and Additional Suggested

Publications:

Modern Projects in Wood,
Metal and Plastic,
Patrick E. Spielman
Bruce Publishing
Do-It-Yourself Encyclopedias

Audio-Visual:

Community:

Local building supply dealer.
Local recreational vehicle
dealer.

este continued and Additional Suggested Learning Experiences

8. Cultural, economic, social, and political factors determine status of man's values and attitudes toward his environment.

Discipline Area Industrial
Subject Metals
Problem Orientation The
of

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING
Cognitive: The students will create a flow chart pointing out the effects & conflicts in cultural, economic, social, & political areas brought about by a metal-industry problem	Affective: The student will realize the cultural, economic, social, & political interactions brought about by a problem in the metal-working industry.	<p>I. Student-Centered in class activity</p> <p>A. Discuss local or widely known pollution problem pertaining to metals industry, ie:</p> <ol style="list-style-type: none"> 1. Water pollution - Lake Superior 2. Noise pollution - Foundry 3. Air pollution - Foundry, steel mill <p>B. Either-</p> <ol style="list-style-type: none"> 1. Have open discussion as to what effects an attempt to clear up a pollution problem has on each aspect of society, ie, Society gets excited, fires up politicians, they chase industry, try to force change. Products prices go up to meet increase, etc. 2. Organize round table discussion between (con't)
ESEA Title III 59-70-0135-2		

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dust the Discipline Area Industrial Arts
tals Attitudes Subject Metals
The 2 Problem Orientation- The Ramifications Grade 10-12
Of Of Change

SUGGESTED LEARNING EXPERIENCES	
I. Student-Centered in class activity	II. Outside Resource and Community Activities
A. Discuss local or widely known pollution problem pertaining to metals industry, ie: 1. Water pollution- Lake Superior 2. Noise pollution- Foundry 3. Air pollution - Foundry, steel mill	A. Local economist. B. Industrial Commission representative. C. Local politician. D. Representative of local metal-fabricating industry.

C. Either-
1. Have open discussion as to what effects an attempt to clear up a pollution problem has on each aspect of society, ie, Society gets excited, fires up politicians, they chase industry, try to force change. Products prices go up to meet increase, etc.

-or-

2. Organize round table discussion between
(con't)

Resource and Reference Materials <u>Publications:</u>	Continued and Additional Suggest als
<p><u>Audio-Visual:</u> <u>#03140- Air Pollution</u> University of Illinois film</p>	<p>(Con't from I.) industrial representative, econ to bring out changes caused by an industrial pollution problem</p>
<p><u>Community:</u> Local economist. Industrial Commission Rep. Local politician. Rep. from local metal working plant.</p>	

als | Continued and Additional Suggested Learning Experiences

(Cont'd from I.)
industrial representative, economist, & politician
to bring out changes caused by attempting to solve
an industrial pollution problem.

C 9. Man has the ability to
O manage, manipulate, and change
N his environment.
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Discipline Area Industr

Subject metals

Problem Orientation Found
Abat

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING E
<p><u>Cognitive:</u> The student will report on two foundries that have installed pollution abatement equipment.</p> <p><u>Affective:</u> The students will realize that foundries produce not only castings but also air, water & noise pollution.</p>		<p>I. Student-Centered in class activity</p> <p>A. View movie <u>Iron Product of the Blast Furnace.</u></p> <p>B. Class discussion:</p> <ol style="list-style-type: none">1. What pollutants are produced by a foundry? A. Air B. Water C. Noise D. Thermal2. Are the pollutants an environmental hazard? How? What is being done? What can be done?3. Relate the results of the discussion back to concept #9.
<p><u>Skills to be Learned</u></p> <ol style="list-style-type: none">1. Man can manage pollution if he wants to.2. Various forms of pollution affect human behavior.3. What pollutants are produced by foundries.		

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change Discipline Area Industrial Arts

Subject Metals

Problem Orientation Foundry Pollution Grade 7-12
Abatement

SUGGESTED LEARNING EXPERIENCES

I. Student-Centered in class activity

- A. View movie Iron Product of the Blast Furnace.
- B. Class discussion:
 1. What pollutants are produced by a foundry?
 - A. Air
 - B. Water
 - C. Noise
 - D. Thermal
 2. Are the pollutants an environmental hazard? How? What is being done? What can be done?
- C. Relate the results of the discussion back to concept #9.

II. Outside Resource and Community Activities

- A. Environmental engineer from foundry.
- B. D.N.R.
- C. Local industry rep. in whose company pollution abatement equipment has been installed.

Resource and Reference Materials

Publications:

Exploring Patternmaking and Foundry
Miner & Miller
D. VanNostrand Company

Continued and Additional Sugges

1. Develop a collection of 10 articles which discuss local related pollution problems in chronological sequence car

Audio-Visual:

#30067 Noise & Health
University of Ill.
#1100 Iron: Product of the
Blast Furnace BAVI

Community:

1. Environmental engineers
2. D.N.R.
3. Local industry rep.

<u>Materials</u>	<u>Continued and Additional Suggested Learning Experiences</u>
<u>Local Mining and Foundry Problems can</u>	<ol style="list-style-type: none">1. Develop a collection of local newspaper articles which discuss local industry related pollution problems so that a chronological sequence can be followed.

the

eers

C 10. Short-term economic gains
O
N may produce long-term
C
E environmental losses.
P
T

Discipline Area Indus
Subject Metals
Problem Orientation M

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING
<u>Cognitive:</u> The student will be able to list the way man's early mining is now costing us money to reclaim the land. <u>Affective:</u> As an adult, the student will be a concerned citizen about land use, and mining operations.		<ol style="list-style-type: none">1. Student-Centered in class activity2. Students will view film on ore open pit mining.3. Students will develop plans that could have been used to reclaim the area as it was mined.4. Students will develop plans that could be used to reclaim these areas today.
<u>Skills to be Learned</u> Land reclamation		

ESSEA Title III - 59-70-0135-2 Project

short-term economic gains

duce long-term

Discipline Area Industrial Arts

mental losses.

Subject Metals

Problem Orientation Mining Waste Grade 7-12

GOAL OBJECTIVES

The student
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early mining
ing us money
the land.
As an adult,
will be a
itizen about
and mining

Learned
information

SUGGESTED LEARNING EXPERIENCES

I.	Student-Centered in class activity 1. Students will view film on ore open pit mining. 2. Students will view slides of old abandoned open pit mines to view how the area is a total waste land. 3. Students will develop plans that could have been used to reclaim the area as it was mined. 4. Students will develop plans that could be used to reclaim these areas today.	II.	Outside Resource and Community Activities Mining companies. Land developers.
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Resource and Reference Materials	Continued and Additional Suggested Lear
<p><u>Publications:</u> <u>Encyclopedias</u> <u>Forging and Welding,</u> <u>Robert E. Smith</u> <u>McKnight & McKnight</u></p>	
<p><u>Audio-Visual:</u> <u>#51311 Copper Mining</u> <u>University of Ill.</u> <u>#1198 Iron Ore Mining BAVI</u></p>	
<p><u>Community:</u> <u>Land developer</u></p>	

earn materials Continued and Additional Suggested Learning Experiences

C 11. Individual acts, duplicated
 O or compounded, produce significant
 C environmental alterations over
 P time.

Discipline Area Industrial

Subject Metals

Problem Orientation Alleviate

Waste

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING EXPERIENCES
<u>Cognitive:</u> The student will list 5 places in which cumulative error will lead to waste.	<u>Affective:</u> The student will become aware of a small error multiplying into a large waste.	<p>I. Student-Centered in class activity</p> <p>A. Basically a general discussion using examples:</p> <ol style="list-style-type: none"> 1. Three classes cutting stock from large piece; if each person cuts his 1/16" long, a full piece or more is wasted before work is started. 2. One person welding without system to exhaust fumes, result is negligible. Many persons welding without exhaust system could be fatal. <p>B. Relate "one instance not too bad, but many instances can be dreadful" Theory to environmental problems, ie:</p> <ol style="list-style-type: none"> 1. Exhaust emission 2. Water pollution 3. Environmental deterioration
ESEA Title III - 59-70-0135-2 Project I-C-E	Skills to be Learned	
	1. Accuracy in measurement	
	2. Economics	
	3. Multiplication of error	

is, duplicated

duce significant
sations over

Discipline Area Industrial Arts

Subject Metals

Problem Orientation Alleviations of Grade 7-12
Waste

EXPERIENCES	SUGGESTED LEARNING EXPERIENCES
	<p>I. Student-Centered in class activity</p> <p>A. Basically a general discussion using examples:</p> <ol style="list-style-type: none">1. Three classes cutting stock from large piece; if each person cuts his 1/16" long, a full piece or more is wasted before work is started.2. One person welding without system to exhaust fumes, result is negligible. Many persons welding without exhaust system could be fatal. <p>B. Relate "one instance not too bad, but many instances can be dreadful" Theory to environmental problems, ie:</p> <ol style="list-style-type: none">1. Exhaust emission2. Water pollution3. Environmental deterioration <p>II. Outside Resource and Activities</p> <p>A. Quality control personnel</p> <p>B. Purchasing agent</p> <p>C. Salvage engineer</p>

Resource and Reference Materials	Continued and Additional Suggested Learning
<u>Publications:</u> <u>Metalwork Technology and Practice</u> Ludwig & McCarthy, <u>McKnight & McKnight</u> <u>Technical Metals,</u> Harold V. Johnson Chas. A. Bennett Co.	1. Have students develop easy reference list or bulletin board stating where sma wastes should be avoided. 2. Set up "point system" and see what membe class can find most instances of waste in 1. School 2. Local community
<u>Audio-Visual:</u> Home-made slide series of photo series showing areas or examples of great waste.	
<u>Community:</u>	1. Quality control person 2. Purchasing agent 3. Salvage engineer

Continued and Additional Suggested Learning Experiences

1. Have students develop easy reference list or bulletin board stating where small wastes should be avoided.
2. Set up "point system" and see what member of class can find most instances of waste in
 1. School
 2. Local community

C 12. Private ownership must be
 O regarded as a stewardship and
 C should not enroach upon or violate
 P the individual right of others.

Discipline Area Indust
 Subject Metals
 Problem Orientation My i
 you

BEHAVIORAL OBJECTIVES		SUGGESTED LEARNING
<u>Cognitive</u> : The student will list 5 "wastes" & explain how these "wastes" affect others. <u>Affective</u> : The student will realize that all pollutants & waste violate the rights of others.		I. Student-Centered in class activity A. Class discussion <ul style="list-style-type: none"> 1. Select a few metal-working industries & develop a list of wastes produced. 2. How do these "wastes" effect others? 3. Is the effect desirable or undesirable? 4. What can be done? 5. What is being done? B. Study thru class developed method, the interaction of "rights".
<u>Skills to be Learned</u> 1. Individual acts affect others. 2. How pollutants are controlled.		

ship must be
 ardship and Discipline Area Industrial Arts
 upon or violate Subject Metals
 ht of others. Problem Orientation My rights vs. Grade 7-12
your rights

SUGGESTED LEARNING EXPERIENCES	
<p>II.</p> <p>ect</p> <p>ives.</p> <p>I. Student-Centered in class activity</p> <p>A: Class discussion</p> <ol style="list-style-type: none"> 1. Select a few metal-working industries & develop a list of wastes produced. 2. How do these "wastes" effect others? 3. Is the effect desirable or undesirable? 4. What can be done? 5. What is being done? <p>B. Study thru class developed method, the interaction of "rights".</p>	<p>II. Outside Resource and Community Activities</p> <p>A. Public relations dept. of local manufacturing plant.</p> <p>B. D.N.R.</p>

Resource and Reference Materials	Continued and Additional Suggested
<u>Publications:</u>	
<u>Metalwork Technology and Practice.</u>	
Ludwig & McCarthy	1. Have students research how to
McKnight & McKnight	handle "encroachment of right
<u>Modern Metalworking,</u>	
John R. Walker	
Hoodheart-Wilcox	
<u>Audio-visual:</u>	
<u>Community:</u>	
1. Public relations man from	
local manufacturer	
2. D.N.R.	

rials. Continued and Additional Suggested Learning Experiences

actice.

1. Have students research how local manufacturers handle "encroachment of rights"

PROJECT I-C-E Episode Evaluation Form (Reproduce)

Please fill in:
Subject: _____

Grade: _____

Concept No. Used: _____

In commenting on each episode form. Feel free to adapt it and your critiques and comments - negative hand column, please rate (poor, good, etc.) and make specific comments or suggestions provided to help us make this a more effective program.

Poor	Good	Exc.	
			I. Behavioral Objectives A. Cognitive: _____
			B. Affective: _____
			II. Skills Developed _____
			III. Suggested Learning Experiences A. In Class: _____
			B. Outside & Community Activities: _____
			IV. Suggested Resource & Reference Materials (specific suggestions & comments) _____

-C-E Episode Evaluation Form (Reproduce or duplicate as needed)

In commenting on each episode used in your class, please use this form. Feel free to adapt it and add more pages. Let us know all your critiques and comments - negative and positive. In the left-hand column, please rate (poor, good, excellent) each item. Also, make specific comments or suggestions if possible in the space provided to help us make this a more usable guide. Thank you.

Behavioral Objectives

A. Cognitive:

B. Affective:

Skills Developed

Suggested Learning Experiences

A. In Class:

B. Outside & Community Activities:

Suggested Resource & Reference Materials
(specific suggestions & comments)

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